

**Application No.: 10/560,589**

**REMARKS**

**I. Introduction**

In response to the Office Action dated August 20, 2009, Applicants have incorporated the limitations of claim 4 into independent claim 1. Claim 4 has been cancelled, without prejudice. In addition, Figs. 23 and 24 have been amended to include the legend "PRIOR ART". Amended Figs. 23 and 24 are attached and labeled Replacement Sheet. Applicants have been careful to avoid the introduction of new matter.

For the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art references.

**II. The Rejection of Claims 1-5 And 10 Under 35 U.S.C. § 102 is Traversed**

Claims 1-5 and 10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Seo (US 2002/0053871). As the limitations of claim 4 have been incorporated into independent claim 1, Applicants will refer to amended independent claim 1 when addressing the rejection of claim 4. Applicants respectfully submit that Seo does not anticipate the pending claims for at least the following reasons.

Amended independent claim 1 recites a light-emitting device comprising a first electrode, a second electrode provided to be opposite to the first electrode, and a light-emitting layer which contains a metal oxide semiconductor porous body. The surface of the metal oxide semiconductor porous body supports an organic light-emitting material, and is provided between the first electrode and the second electrode. The organic light-emitting material is chemisorbed to the surface of the metal oxide semiconductor porous body.

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One feature of the present disclosure is the organic light-emitting material is chemisorbed to the surface of the metal oxide semiconductor porous body. This feature utilizes the efficient electron injection into an organic material layer, such as a light-emitting layer, even when indium titanium oxide (ITO) having a high work function or the like is used for an electron injection electrode. As a result of this feature, the light-emitting device is prevented from being deteriorated due to the separation of the organic material from the surface of the metal oxide semiconductor porous body at the interface between the porous body and the electrode.

It is alleged that Seo discloses, in paragraph [0063], an organic light-emitting material that is chemisorbed to the surface of a metal oxide semiconductor porous body. Applicants respectfully disagree. Paragraph [0063] of Seo recites:

“metal alkoxide 203 (M denotes a metal) including the same kind of metal element as the metal 201 is chemically absorbed onto the metal having the hydroxyls (FIG. 2B). Finally, the surface onto which the metal alkoxide 203 is chemically absorbed is hydrolyzed to again provide hydroxyls 202b on the surface (FIG. 2C).”

Thus, as is recited, Seo merely teaches that the metal alkoxide is chemisorbed onto a metal, not that an organic light-emitting material is chemisorbed to the surface of the metal oxide, as a metal is not an organic light-emitting material. Rather, Seo teaches, in paragraphs [0021] and [0079]-[0083] that the anodization processing is performed using the formed Ta film as an anode in an oxalic acid solution to form an oxide film 403. The oxide film 403 is composed of a porous layer 403a having pores vertical to the film surface and a barrier layer 403b. The luminescent layer 404 is formed by spin coating or dip coating using a PPV derivative solution in which the PPV derivative is dissolved in toluene. As such, Seo does not

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disclose chemisorption of the organic light-emitting material. Thus, it is clear that Seo fails to teach or suggest all of the limitations of amended independent claim 1 of the present disclosure.

Anticipation under 35 U.S.C. § 102 requires that each and every element of the claim be disclosed, either expressly or inherently in a prior art reference, *Akzo N.V. v. U.S. Int'l Trade Commission*, 808 F.2d 1471 (Fed. Cir. 1986). At a minimum, for the reasons set forth above, Seo does not disclose light-emitting device comprising a first electrode; a second electrode provided to be opposite to the first electrode; and a light-emitting layer which contains a metal oxide semiconductor porous body, by the surface of which an organic light-emitting material is supported, and is provided between the first electrode and the second electrode, wherein the organic light-emitting material is chemisorbed to the surface of the metal oxide semiconductor porous body. Therefore, as it is apparent from the foregoing that Seo fails to anticipate amended claim 1 or any dependent claims thereon, Applicants submit that amended claim 1 is allowable and patentable over the prior art. As such, Applicants respectfully request that the § 102 rejection of claim 1 be withdrawn.

Moreover, Roitman does not, and is not relied upon to remedy this deficiency. Roitman discloses, in Fig. 4 and paragraph [0023], an organic polymer based electroluminescent device includes a hole transport layer (HTL)(308) having a mixture of glass beads 310 and PEDOT, the hole transport layer (HTL)(308) acting as a spacing layer. However, Roitman does not disclose that the organic light-emitting material is chemisorbed to the surface of a metal oxide.

**III. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable**

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are

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contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claim 1 is patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.

#### **IV. Conclusion**

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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